

## REMARKS

Reconsideration and allowance of the present application are respectfully requested.

Claims 1-20 are pending in the application.

Applicants note that claims 2, 5, 7-10, 12 and 15-20 have not been rejected over prior art.

The rejection of claims 1-20 under 35 U.S.C. § 112, first paragraph, on pages 2-3 of the Office Action, is obviated in part by the amendment to claims 1-20 as set forth above and is respectfully traversed in part.

The "cross-linking agent" as been amended to "aldehyde cross-linking agent," as set forth above. Support for this amendment can be found in the originally filed application, including at page 2, line 28 to page 3, line 4.

Applicants respectfully submit that the term "active centre species" is well defined. The term active centre species includes cyclic structures, acetals and hemi-acetals. See page 2, lines 9-11 and line 28 through page 3, line 4, of the present application. A person skilled in the art would understand this term in light of the present specification and be enabled to make and use the invention. The use of glutaraldehyde, as an example, is sufficient for a skilled person to appreciate the metes and bounds.

Furthermore, a skilled person reading and comprehending the present specification would know what compounds would be present to be removed when the cross-linking agent is a cross-linking aldehyde.

Applicants respectfully submit that the claimed invention fully complies with Section 112, first paragraph. Accordingly, withdrawal of the Section 112, first paragraph, rejection is respectfully requested.

The rejection of claims 1-20 under 35 U.S.C. § 112, second paragraph, on pages 3-4 of the Office Action, is obviated in part by the amendment to claims 1-20 as set forth above and is respectfully traversed in part.

Applicants respectfully submit that the statement "group 3 hydrolase" is, indeed, definite, and refers to a specific class of enzymes identified in accordance with the standard nomenclature adopted by the Nomenclature Committee of the

International Union of Biochemistry and Molecular Biology (NC-IUBMB) (see, e.g., <http://www.chem.qmul.ac.uk/iubmb/enzyme/>). As stated by the Enzyme Commission, class 3 (EC 3) refers specifically to hydrolases that act on different types of bonds or substrates. Applicants' use of "group 3 hydrolase" is consistent with this well-accepted nomenclature.

Applicants respectfully submit that the term "other active centre species" fully complies with Section 112, second paragraph. As discussed above, this term includes cyclic structures, acetals and hemi-acetals. See page 2, lines 9-11 and line 28 through page 3, line 4, of the present application. A person skilled in the art would understand this term in light of the specification and be enabled to make and use the invention. The use of glutaraldehyde, as an example, is sufficient for the skilled person to appreciate the metes and bounds of this term.

Furthermore, a person skilled in the art reading and comprehending the present specification would know what compounds would be present to be removed when the cross-linking agent is a cross-linking aldehyde.

Applicants respectfully submit that the claimed invention fully complies with Section 112, second paragraph. Accordingly, withdrawal of the Section 112, second paragraph, rejection is respectfully requested.

The rejection of claims 1, 3, 4, 6, 11, 13 and 14 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 4,369,226 (Rembaum), on page 5 of the Office Action, is respectfully traversed. Claims 1, 3, 4, 6, 11, 13 and 14 are not anticipated by Rembaum for the following reasons.

In Example 1, Rembaum teaches that commercial glutaraldehyde solutions can be treated with activated carbon yielding a solution free of polymeric species. Rembaum then proceeds to take this purified glutaraldehyde solution, and create polymer by base catalysis, leading to polymeric glutaraldehyde with a MW of ~20 kDa.

Rembaum uses this polymerized glutaraldehyde in all subsequent examples, stating that the polymerized glutaraldehyde is better suited to covalent binding of various proteins, and leads to a faster reaction time (Figures 2 and 3). Ultimately, Rembaum states "[t]he high reactivity of polyglutaraldehyde, its stability, ease of

administration, and the retention of human immunoglobulins bound to the polymer, makes it a desirable new reagent for protein binding". The summary of invention section in Rembaum states that "[i]n contrast to monomeric glutaraldehyde, the polymer contains conjugated aldehyde groups. This imparts stability to the Schiff's bases formed after reaction with proteins, and, further, since the hydrophilic polyglutaraldehyde has relatively long chains extending from the surface into the surrounding aqueous medium, the heterogeneous reaction with protein is facilitated."

Thus, although Rembaum discloses the use of activated carbon to remove polymeric species from glutaraldehyde solutions, Rembaum also discloses and teaches that the polymeric form of glutaraldehyde is the superior moiety for protein immobilization. This is in direct contrast to Applicants' approach, findings and teachings.

Applicants' results, indeed, show that use of activated carbon can remove polymeric glutaraldehyde and other active centre species. Rembaum subsequently treated this purified solution with base to create polymeric forms of glutaraldehyde for immobilization. In contrast, Applicants use the purified glutaraldehyde solution, with a lower polyaldehyde content, to effect immobilization, and, indeed, found that in instant process, using a glutaraldehyde solution with greater monomeric content provided superior protein immobilization.


Applicants' use of a glutaraldehyde solution with a greater monomeric content is, thus, in direct contrast to the procedure and teachings of Rembaum. Rembaum explicitly prepared and used polymeric glutaraldehyde, because Rembaum believed that polymeric glutaraldehyde was superior to the monomeric form. For these reasons, Rembaum, in fact, not only does not disclose present process but leads away from the presently claimed process.

In view of the many differences between the claimed invention and Rembaum, withdrawal of the Section 102 rejection is respectfully requested.

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In light of all of the objections and rejections of record having been addressed, Applicants submit that the claimed invention is in condition for allowance and Notice to that affect is respectfully requested.

Respectfully submitted,  
Manelli Denison & Selter, PLLC

By   
Jeffrey S. Melcher  
Reg. No.: 35,950  
Tel. No.: 202.261.1045  
Fax. No.: 202.887.0336

Customer No. 20736  
2000 M Street, N.W. , 7<sup>th</sup> Floor  
Washington, D.C. 20036-3307